CLAIMS

1. A method of detecting cancer using a laser biocavity having a semiconductor laser including a microchannel through which cells in fluid traverse, comprising:

determining the laser wavelength of the laser biocavity with only fluid in the microchannel;

determining the wavelength shift of the biocavity when each cell passes through the microchannel; and

determining the percentage of cells in G2 phase from the wavelength shift of the cells; wherein an increased percentage of G2 phase cells is an indication of cancer.

determining the shape of the G1 cell distribution, wherein an increased breadth of the G1 distribution is an indication of increased cell growth rate.

2. The method of claim 1 wherein the step of determining the percentage of cells comprises counting the number of cells which are tested, and counting the number of cells with a wavelength shift in a range where G2 phase cells are expected.

3. The method of claim 1 wherein the step of determining the percentage of cells comprises forming a histogram of the number of cells as a function of wavelength shift, and comparing the number of cells at the wavelength shift where G2 phase cells are expected with the number of cells at the wavelength shift where G1 phase cells are expected.

4. A method of determining the phase of cells in the cell cycle using a laser biocavity having a semiconductor laser including a microchannel through which a cell in fluid traverses, comprising:

determining the laser wavelength of the laser biocavity with only fluid in the microchannel;

determining the wavelength shift of the biocavity when a cell passes through the microchannel;

determining the phase of the cell based on the wavelength shift; wherein there is greater wavelength shift for a cell in G2 phase than a cell in G1 phase.

5. The method of claim 4 further comprising:

determining the wavelength shift of the biocavity for each of a plurality of cells in fluid; and

determining the relative number of cells in G1 and G2 phase from the number of data points grouped about distinct values of wavelength shift; wherein an increased number of cells in G2 phase is an indication of cancer.

6. A method of determining cell concentration comprising measuring the wavelength shift of a few hundred cells in a biocavity laser; and determining from the wavelength shift the percentage of cells having a concentration greater than the concentration of a normal cell.

7. The method of claim 6 further comprising determining that said cells are cancerous if the percentage of cells have a concentration greater than the concentration of a normal cell exceeds a predetermined amount.